

Paint Poisoning in Cattle

BY L. T. GILTNER ¹

CATTLE ARE POISONED by lead paint much more often than most people realize. The author of this article has made a special study of the problem and describes the causes, symptoms, prevention, and treatment.

IN THIS DISCUSSION, paint poisoning refers to the poisoning that results from the ingestion of any of the lead-containing paints. It is the lead in the paint that causes the trouble.

Cattle may also take into their bodies poisonous quantities of lead from many sources other than paint. Lotions, ointments, and salves contain lead and, when applied externally for the treatment of sores, inflammatory conditions, and parasitism, may be licked off, or the lead may be absorbed through wounds. Lead shot or bullets are sometimes taken up by cattle grazing near shooting ranges; as few as 300 shot have proved fatal to a cow. Herbage in the vicinity of smelters may be covered with a layer of dust containing lead, and the forage plants in such areas may take up lead from the soil. The effluent from smelters may contaminate streams with considerable quantities of lead. Dangerous amounts may be deposited on vegetation in orchards sprayed with lead arsenate solution or other solutions containing lead; the danger is particularly great if the herbage is grazed before rain has fallen. Old batteries, the exhaust fumes from gasoline engines using tetraethyl lead gasoline, and boiled linseed oil are sources of lead to which cattle may at times have access. Soft water conducted through lead pipes and sour feeds such as mashes and milk in leaden containers are sometimes sources of lead poisoning. Finally, mistakes sometimes made in dispensing medicines have caused lead poisoning; for example, sugar of lead (lead acetate) has been mistaken for Glauber's salt or common salt, and white lead has been erroneously used for chalk.

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Paint, however, is by far the most common source of lead poisoning in cattle. These animals are fond of licking paint, especially fresh paint, from fences, posts, gates, the exterior of barns, or the walls, partitions, stanchions, and other parts of stables. Also they frequently find discarded paint cans, buckets, or other containers and lick enough paint from them to cause fatal poisoning.

Of all the domestic animals, cattle are the most sensitive to lead poisoning in relation to their size, calves being especially susceptible. Fröhner² states that horses can tolerate 10 times larger quantities of lead than cattle can; he gives the following list of the amounts of sugar of lead that are fatal for certain animals: Cattle, 50 to 100 grams; horses, 500 to 750 grams; sheep and goats, 20 to 25 grams; swine and dogs, 10 to 25 grams.

More farm animals are poisoned by lead than by any of the other metallic poisons, and the losses among cattle are greater than the combined losses of all other species. Because of the universal use of paint, the danger of lead poisoning of cattle exists in every farming community. Individual cases in both calves and mature cattle occur frequently, and it is not uncommon for a large percentage of a herd to be affected.

Lead acts as a local corrosive irritant to the mucous lining of the stomach and intestines. After being absorbed, it acts on the psychic, motor, and vasomotor centers of the brain. (The vasomotor nerves control the dilation and contraction of the blood vessels.) Most cases of lead poisoning in cattle are of the acute type resulting from the consumption of large quantities of lead at one time.

The first symptoms are usually marked salivation, slobbering, choking, colic, and suppression of the appetite and milk secretion. Diarrhea may occur, but constipation is much more common, and bloating often ensues. The symptoms arising from derangement of the central nervous system are most striking and characteristic, although they are often confused with those caused by agencies other than lead. There is a pronounced trembling, accompanied by champing of the jaws, attacks similar to those of epilepsy, and a tendency to walk in circles or to push blindly forward into fences or other obstacles. Frequently the affected animals show symptoms of mania, running about wildly with all indications of blindness and colliding with or breaking down objects in their path. Death may occur suddenly during or following such an attack, or there may be sleepiness, weakness, paralysis of the hindquarters or other parts of the body, and eventually deep coma and death. Animals fatally affected seldom live more than a few days.

Poisoning occasionally occurs in the chronic form as a result of ingestion of small quantities of lead over a long period. In such cases there is a general disturbance of the nutrition of the body, with progressive wasting and general weakness. There may be intermittent attacks of colic, staggering, uncoordinated movements, stiffness of the joints, and convulsive seizures. Sometimes there are pustular eruptions in the skin, accompanied by more or less itching. Blind-

² FRÖHNER, EUGEN. *LEHRBUCH DER TOXIKOLOGIE FÜR TIERÄRZTE*. Dritte Auflage, 391 pp. Stuttgart, 1910.

ness, wasting of the muscles, ulceration of the mucous membrane of the mouth cavity, abortion, and sterility are not uncommon.

In acute cases of lead poisoning, the lining membrane of the stomach and intestines will be found to be reddened and inflamed, with areas of ulceration. The mucous membrane of the intestine has a grayish to black discoloration. The intestines are contracted, and the outer surface may be rather pale in color. When the brain cavity or the spinal canal is opened, an excessive amount of fluid pours out, and both brain and spinal cord appear congested. Small blood spots are seen frequently on the surface of the heart or under the membrane lining the chest cavity and covering the lungs. In chronic lead poisoning, the body is in a poorly nourished condition, and the internal organs, particularly the kidneys, appear shrunk, owing to growth of connective tissue that has to some extent replaced the softer glandular tissue.

At times the symptoms and post mortem findings do not suffice to establish a diagnosis, and laboratory methods must be used. For this purpose not only the stomach contents but also a generous part of the liver should be supplied to the chemist for analysis. Lead is readily absorbed and very slowly excreted from the body, being stored in the liver, central nervous system, pancreas, and bones. In cases of true lead poisoning, the recovery of lead from such organs as the liver by chemical analysis is therefore not difficult.

Poisoning by lead from paint or other sources is nearly always the direct result of carelessness or mismanagement. When any painting job is to be done about the farm, cattle should be kept away from the newly painted surfaces, and the containers used for mixing the paint as well as the original containers should be carefully disposed of on completion of the work. When the interior of the stable is to be painted, particularly such objects as the stanchions, a nonlead paint that is not poisonous should be used; in general, a good whitewash is quite satisfactory for large wall areas. Before new paint is applied, the surfaces should be scraped to remove old paint scales, which should be safely disposed of.

The animals should not be allowed access to any other sources of lead such as those mentioned at the beginning of this article. Since treatment is usually not very satisfactory, preventive measures are particularly important and should be kept in mind by the stock owner.

The medical treatment of lead poisoning is to a large extent symptomatic. When an animal is in a state of great excitement, the veterinarian usually administers such hypnotics or anticonvulsants as chloral hydrate. After the animal has become paralyzed, such agents should not be employed. One of the commonest antidotes is Epsom salts, in a purgative dose; these salts bring about a precipitation of the lead in the form of an insoluble lead compound and tend to prevent further absorption. In recent years veterinarians have obtained some favorable responses through the intravenous injection of calcium gluconate.